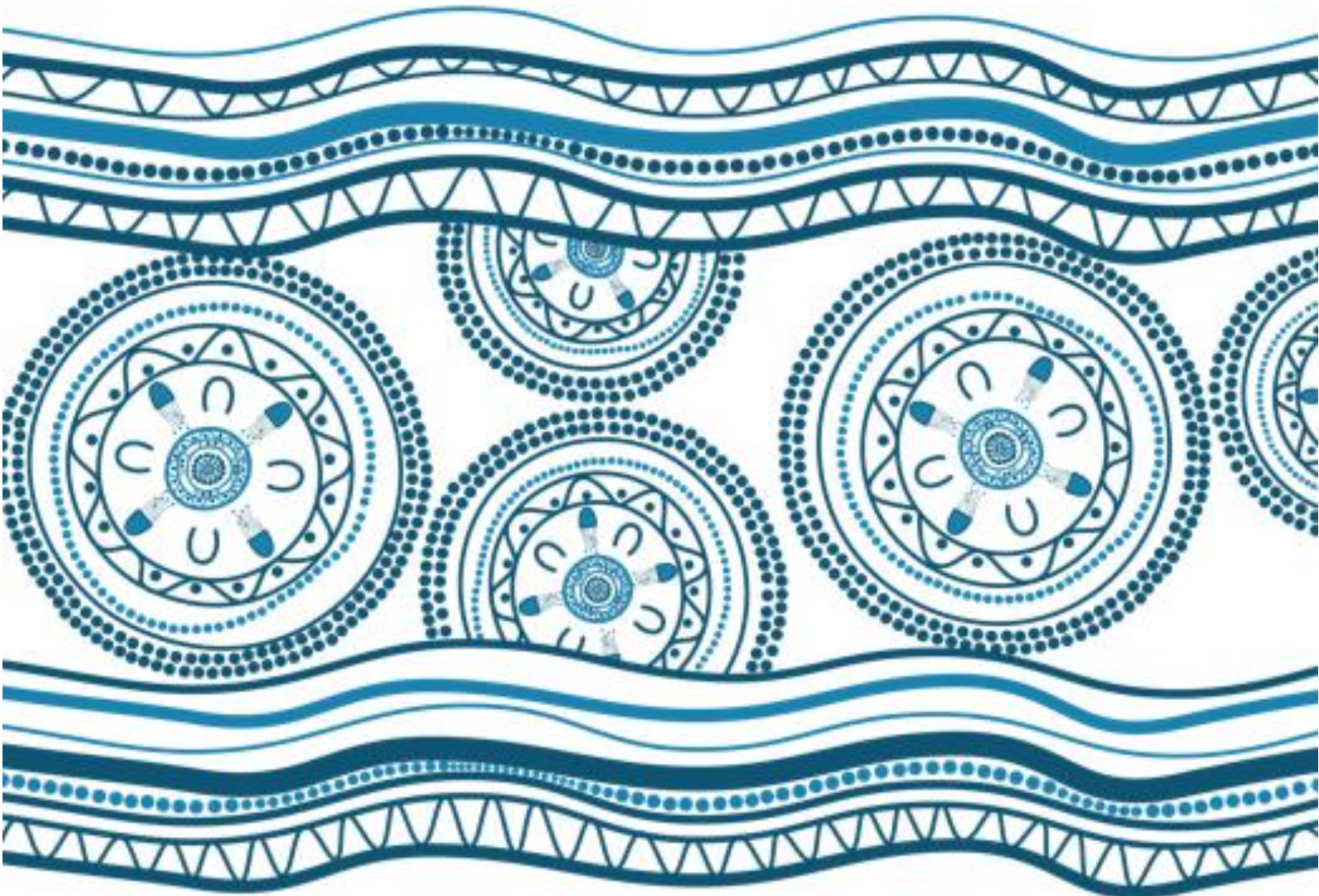


Chapter 24

Hazard and risk



BLANK PAGE

24 Hazard and risk

This chapter presents an assessment of the hazards and risks which may present as a result of the construction and operation of the project and identifies mitigation and management measures to minimise and reduce these impacts. Specifically, this chapter assesses impacts on airspace, navigational safety, existing utilities and hazardous spills.

24.1 Assessment methodology

The method for assessing hazard and risks as they relate to airspace, navigational safety existing utilities and hazardous spills involved:

- Identifying what the potential hazard and risks would be during construction and operation of the project
- Reviewing relevant policy guidelines for managing the hazards or risks
- Assessing the potential impacts of these hazard and risks
- Recommending mitigation to avoid or minimise impacts from the hazard and risks.

24.1.1 Policy framework

The assessment has been undertaken in accordance with the following policies and regulations:

- Code of Practice for Water Management (NSW Roads and Traffic Authority, 1999)
- *Airports Act 1996* (Cth)
- Airport Regulations 1997 (Australian Government, 1997)
- NSW Marine Safety Regulation 2016 (NSW Government, 2016d).

24.2 Airspace

The project is located about four kilometres southeast of Sydney (Kingsford Smith) Airport. It is therefore within the airport's airspace where prescribed limits are set under law that restrict the height of structures and activities to ensure the safe operation of aircraft.

The *Airports Act 1996* (Cth) and the Australian Government Airport Regulations 1997 define the Obstacle Limitation Surface (OLS) and Procedures for Air Navigation Services Aircraft Operations (PAN-OPS) airspace to protect aircraft landing and taking off. The OLS is defined by international specifications adopted by the Civil Aviation Safety Authority (CASA) and defines the airspace surrounding an airport that must be free of obstacles. The PAN-OPS are procedures that enable aircraft to fly safely in poor weather conditions and must also be free of obstacles. These regulations set height restrictions where activities cannot 'intrude' on the airspace.

The Sydney (Kingsford Smith) Airport Prescribed Airspace OLS chart (Sydney Airport, 2018) determines the airspace height restrictions above the project as 50 metres above Australian height Datum (mAHD) for the La Perouse project area and between 51 mAHD and 70 mAHD for the Kurnell project area. The Sydney (Kingsford Smith) Airport PAN-OPS chart (1-3) (The Airport Group, 2017a; The Airport Group, 2017b; and The Airport Group, 2017c) identifies the project area within the Circling – Cat A & B area with a horizontal plane (HP) limit (height at which aircraft should not fly below, and which objects should not intrude) of 126.4 mAHD.

Other prescribed activities within a prescribed airspace include systems that may interfere with ground-based air navigation equipment (eg radar) as well as obstruction of airport safety lights, or lighting that may blind pilots. The project area is not mapped within the Sydney (Kingsford Smith) Airport charts on Navigation Aids Protected Surfaces (Chart 3), High Intensity Light Protected Surfaces (Chart 4), or the Precision Approach Path Indicator (PAPI) system protection surfaces (Chart 7) (Sydney Airport, 2015c).

24.2.1 Assessment of impacts on airspace

Intrusion of airspace

Construction equipment that operates at height has the potential to intrude into the airspace restrictions, such as cranes and drill rigs. The project would require the following high equipment:

- A 150-tonne crane located on the jack-up barge to lift and install piles and support pre-cast installation.
- A drill rig for the installation of piles if the screwed method is used. This would be supported by a separate crane to lift piles into the vertical position to install.
- A 250-tonne jack-up barge which can be used to support piling activities over water.
- A 250-tonne crane barge which is a crane on a separate barge rather than a jack-up barge. This would provide a longer reach for the crane.
- A 50-tonne crane located on a jack-up barge.
- A 200-tonne crawler crane that is land-based and would be used for inshore piling at La Perouse.

The 200-tonne crawler crane would be the tallest piece of equipment used on site. The crane boom can vary in length, up to around 80 metres. The topography where the crane would be operated is about 5 mAHD at La Perouse, and about 3 mAHD at Kurnell. Constructability estimates show that the crane can be operated below the height restriction of 50 mAHD at both La Perouse and Kurnell.

No cranes or other high equipment would be used during the operation of the project which could impact the OLS and PAN-OPS airspace restrictions. In addition, lighting of the project both during construction and operation would not exceed 150 lux illumination level and would be downlit so as to avoid obstructing pilot's vision. During operation of the ferry service, there would be no equipment required that would interfere with aircraft navigational systems.

Bird strike

The exposure of organic material during the planned earthworks can attract wildlife. This could increase the risk of bird strike by aircraft. Due to the limited earthworks, the construction activities are unlikely to attract additional birdlife to the area. Any spoil stockpiles would be covered to avoid attracting wildlife. Birds could also be attracted to the wharves from recreational fishing activities. As existing recreational fishing occurs in the surrounding area, it is unlikely that the wharves would significantly increase bird activity.

Noise generated by construction activities could startle birds and cause them to take flight which may increase the risk of bird strike by aircraft. With a slow start-up process this impact would be mitigated. Noise during operation, such as the ferry horn may also startle birds, however, as this is likely to occur at regular intervals, it is anticipated that birds would become accustomed to the sound and be less likely to startle (Marshall Day Acoustics, 2014).

24.3 Navigational safety

A Navigational Safety Assessment (refer to Appendix L (Navigational Safety Assessment)) has been prepared to assess the construction and operational impacts from the project with regard to maritime safety. The following provides a summary of the key hazards and risks associated with the construction and operation of the project in the marine environment.

Navigational safety as it applies to traffic and transport within the marine environment is assessed in Chapter 12 (Traffic and transport).

24.3.1 Submerged cable and no anchoring area

There are submerged 132 kV electrical cables located within the construction boundary at Kurnell, about 25 metres from the end the proposed wharf. The cable corridor easement runs between

Kurnell and La Perouse and has an associated sign-posted no-anchoring zone within 200 metres of the cable easement (see Figure 24-1).

An exemption certificate would need to be obtained from the Port Authority of NSW to allow construction vessels to anchor in this exclusion zone. Anchoring would not occur within the cable easement itself. Anchoring in this zone would not be required for the operation of the ferry vessels.

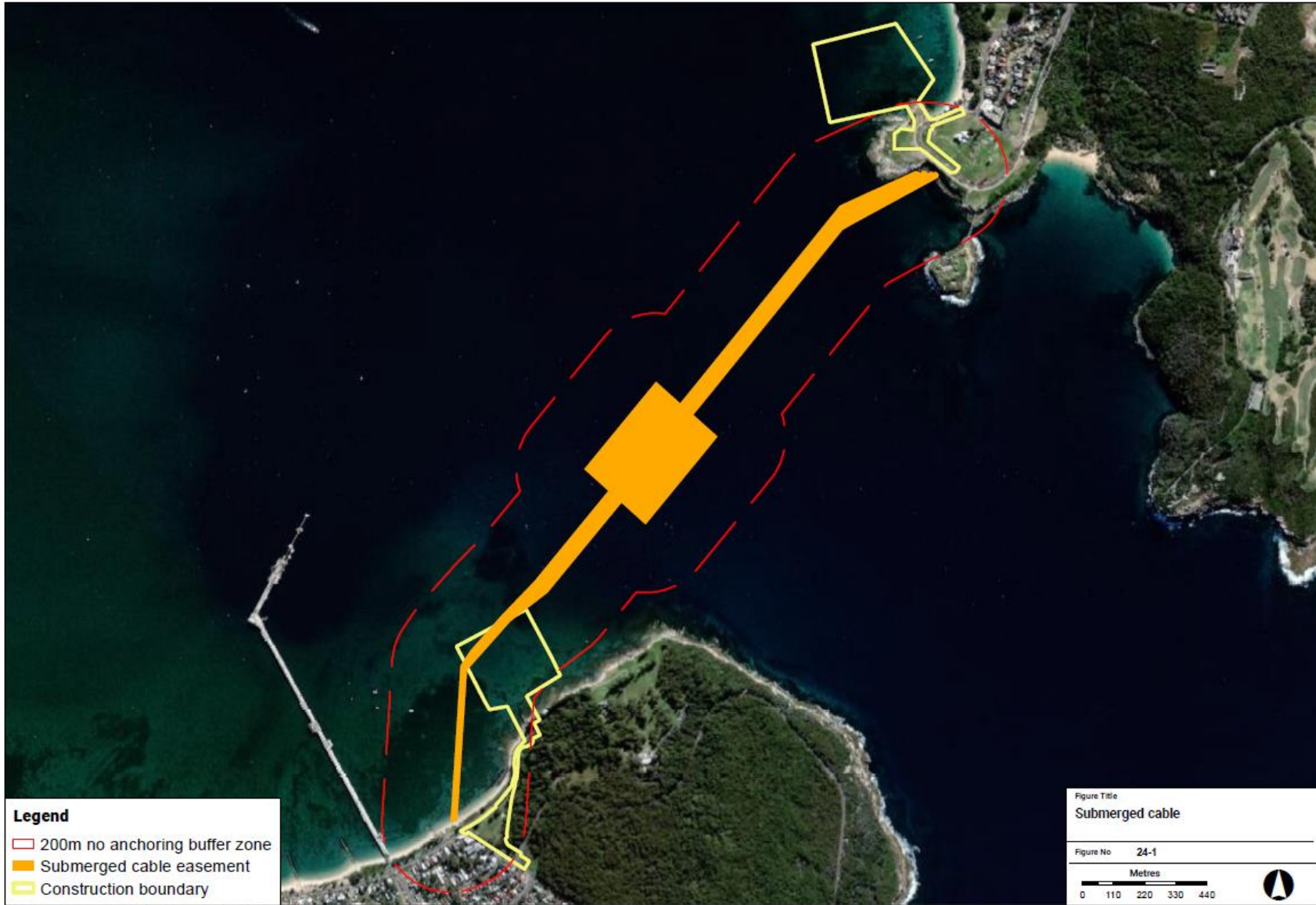


Figure 24-1: Cable easement

24.3.2 Extreme weather

Botany Bay is subjected to extreme swell and wave conditions during storm events. During both construction and operation of the project, storm conditions could pose safety risks for construction workers, operational staff of ferry vessels and wharf users. A Construction Environment Management Plan (CEMP) would include measures to ensure the safe use of construction vessels and contingency measures during extreme weather conditions. Once operational, the ferry service would not operate in extreme weather conditions and would be berthed at a safe location within Botany Bay. This location would be determined by the operator once selected.

The project has also been designed in a way to minimise the impact of storms and other weather events that may be exacerbated by climate change. These are discussed in further detail in Chapter 19 (Climate change).

24.4 Utilities

In addition to the submerged cable, there are other utilities within the La Perouse and Kurnell construction boundaries including water, wastewater, power and telecommunications. At La Perouse, the construction of the wharf may require the removal of two light poles and associated cabling at the headland. No other utilities are expected to be relocated. Details of any required relocation would be confirmed during detailed design and under consultation with the utility providers.

There is a risk with any construction near existing utilities that if they are encountered it could cause a risk to construction workers and compromise the utility service. Standard mitigation measures to avoid impacts to utilities would be incorporated into the CEMP.

24.5 Spills

Fuel leaks and spills could occur during construction if proper handling procedures are not followed. This may be caused by accidents such as vehicle or vessel collisions, and wear and tear of equipment, plant and machinery. Once operational, fuel leaks from the ferries could also occur if they are not properly maintained or are involved in an accident. This has the potential to contaminate the surrounding environment.

Spillages of hazardous material during construction would be managed through an Emergency Spill Management Plan. This plan would include measures such as regular inspections of machinery and equipment for fuel or hydraulic fluid leaks to prevent leakages. It would also outline the process to respond to and contain a spill once it has occurred, including where spill kits should be provided. The ferry service operator would be responsible for implementing spill management measures in accordance with the standard operating procedure for ferries in Sydney managed by Transport for NSW and required by the Harbour Master.

24.6 Environmental management measures

Table 24-1 outlines the environmental management measures to mitigate against potential hazards and risks.

Table 24-1: Environmental management measures for hazards and risks

Impact	ID	Environmental management measure	Responsibility	Timing
Construction equipment potential to intrude airspace	HZ1	All equipment used onsite will not exceed the maximum obstacle limit survey height of 50 metres Above Height Datum (mAHD) at La Perouse and 50 to 70 mAHD at Kurnell. Equipment used on site will also not exceed the PAN-OPS limit of 126.4mAHD.	Contractor	Construction
Nearby bird populations startled during construction	HZ2	A gradual start-up of noise generating construction activities will be introduced each day onsite.	Contractor	Construction
Construction vessels impacting submerged cable	HZ3	An exemption certificate will be obtained from the Port Authority NSW to allow construction vessels to anchor within the 200-metre exclusion zone of the submerged Ausgrid power cable. Vessels will not be allowed to anchor on the cable or environmentally sensitive areas.	Contractor	Construction
Accidental spills	HZ4	An Emergency Spill Management Plan (ESMP) will be prepared in accordance with the Code of Practice for Water Management (NSW Roads and Traffic Authority, 1999) and relevant NSW EPA guidelines. It will be implemented under the WEMP. The ESMP will measures to be implemented in the event of a spill, including initial response, containment/cleaning up, and emergency services and relevant authority notifications including Transport for NSW, Port Authority NSW and NSW EPA.	Contractor	Pre-construction and operation
	HZ5	Spill kits will be kept onsite, on vessels and held within all vehicles. Training will be provided in the use and correct disposal of kits.	Contractor	Construction
Accidental spills over water	HZ6	Any significant spill not contained onsite, whether it occurred in water or on land and subsequently entered the water, will be immediately reported to the Harbour Master and Sydney Vessel Traffic Service (VTS).	Contractor	Construction
Operational spill over water	HZ7	Operational spill management environmental mitigation measures will be included in the standard operating procedure for ferries in Sydney managed by Transport for NSW and required by the Harbour Master.	Transport for NSW	Operation